Sheet 1/ 24

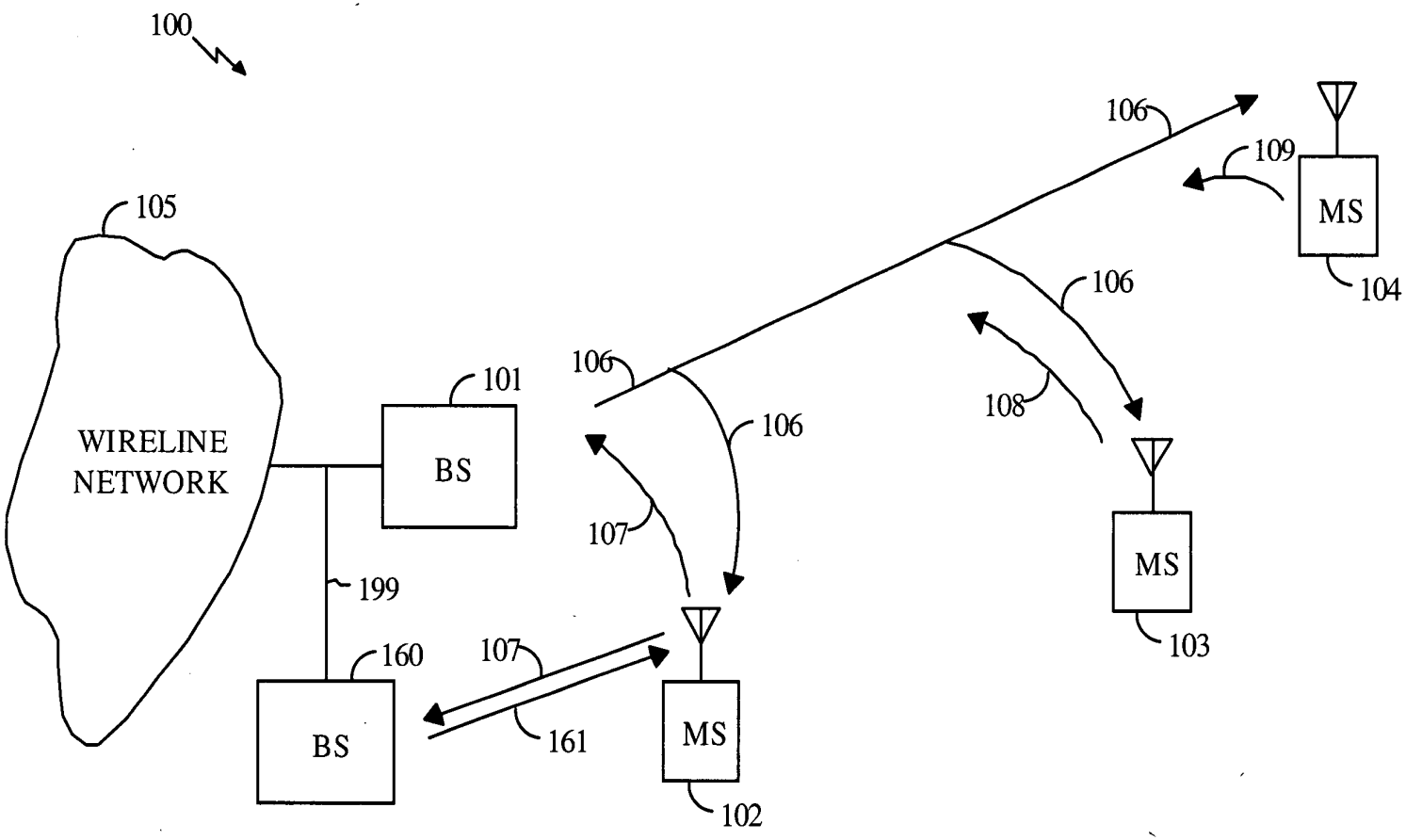

FIG. 1

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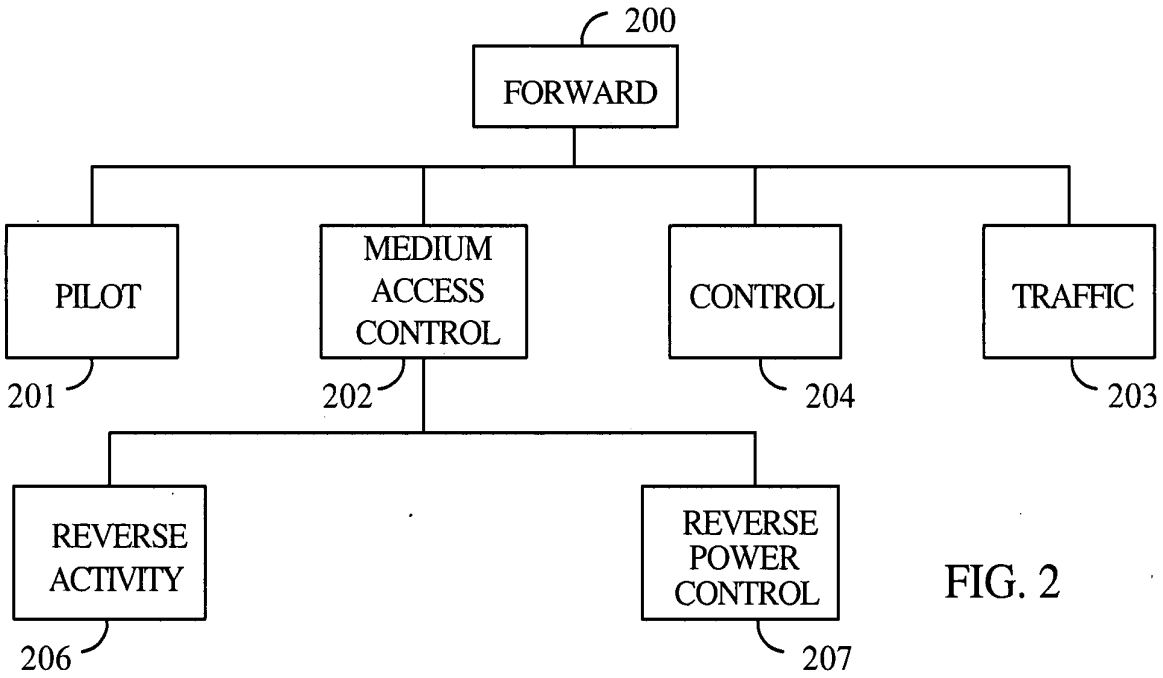

FIG. 2

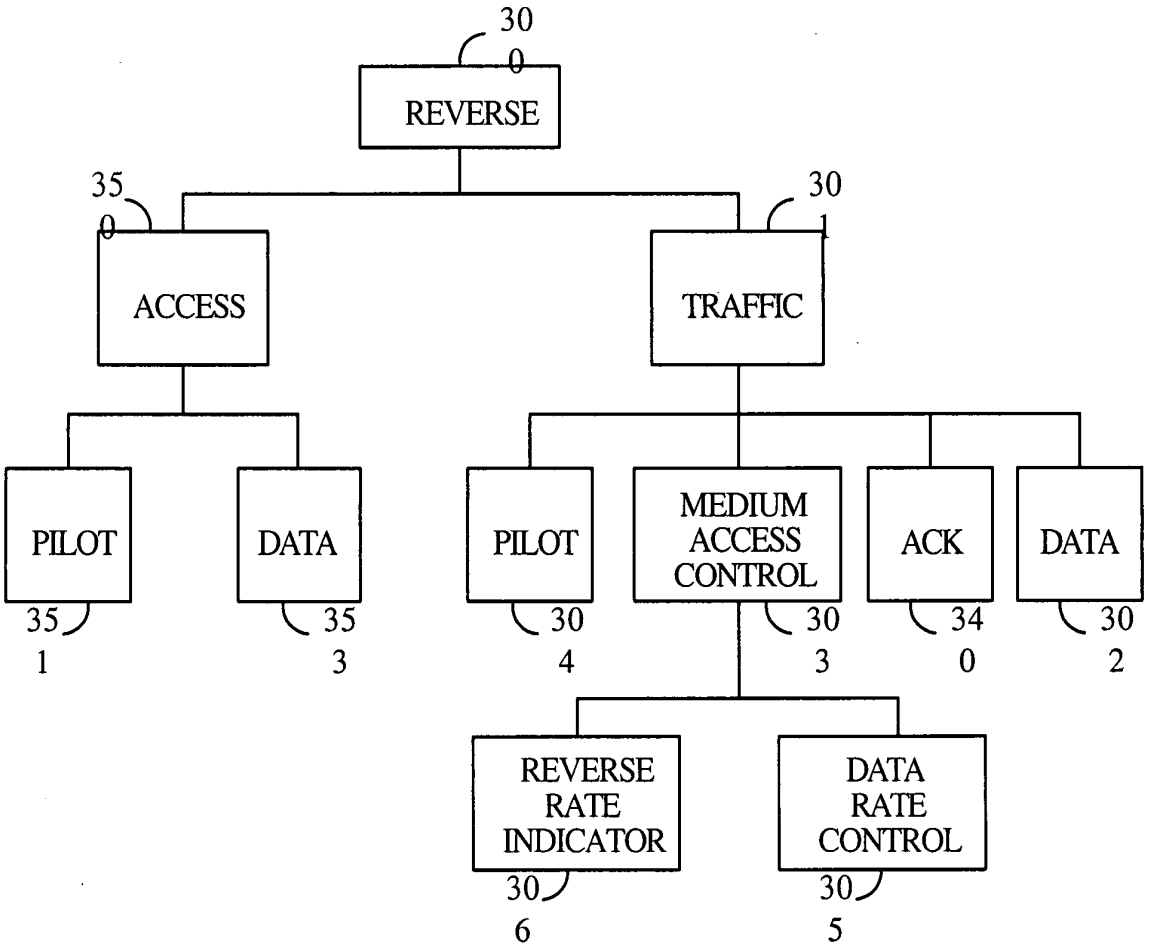
30
0
REVERSE
35
0
ACCESS
30
1
TRAFFIC
PILOT
35
1
DATA
35
3
PILOT
30
4
MEDIUM ACCESS CONTROL
30
3
ACK
34
0
DATA
30
2
REVERSE RATE INDICATOR
30
6
DATA RATE CONTROL
30
5

FIG. 3

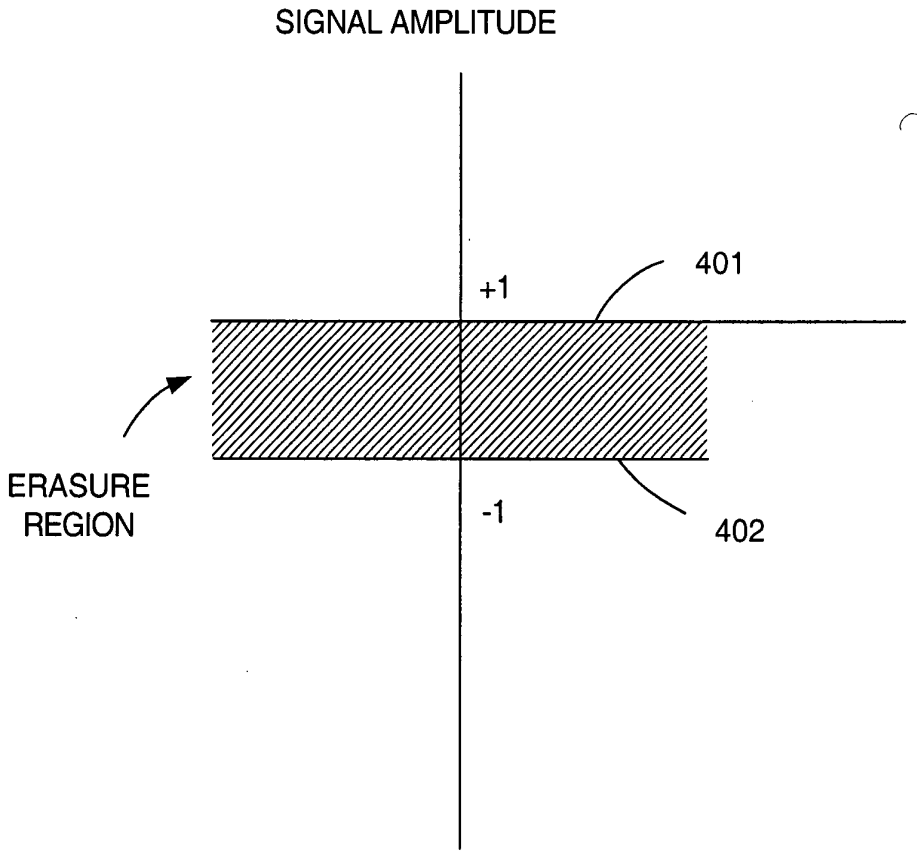

FIG. 4

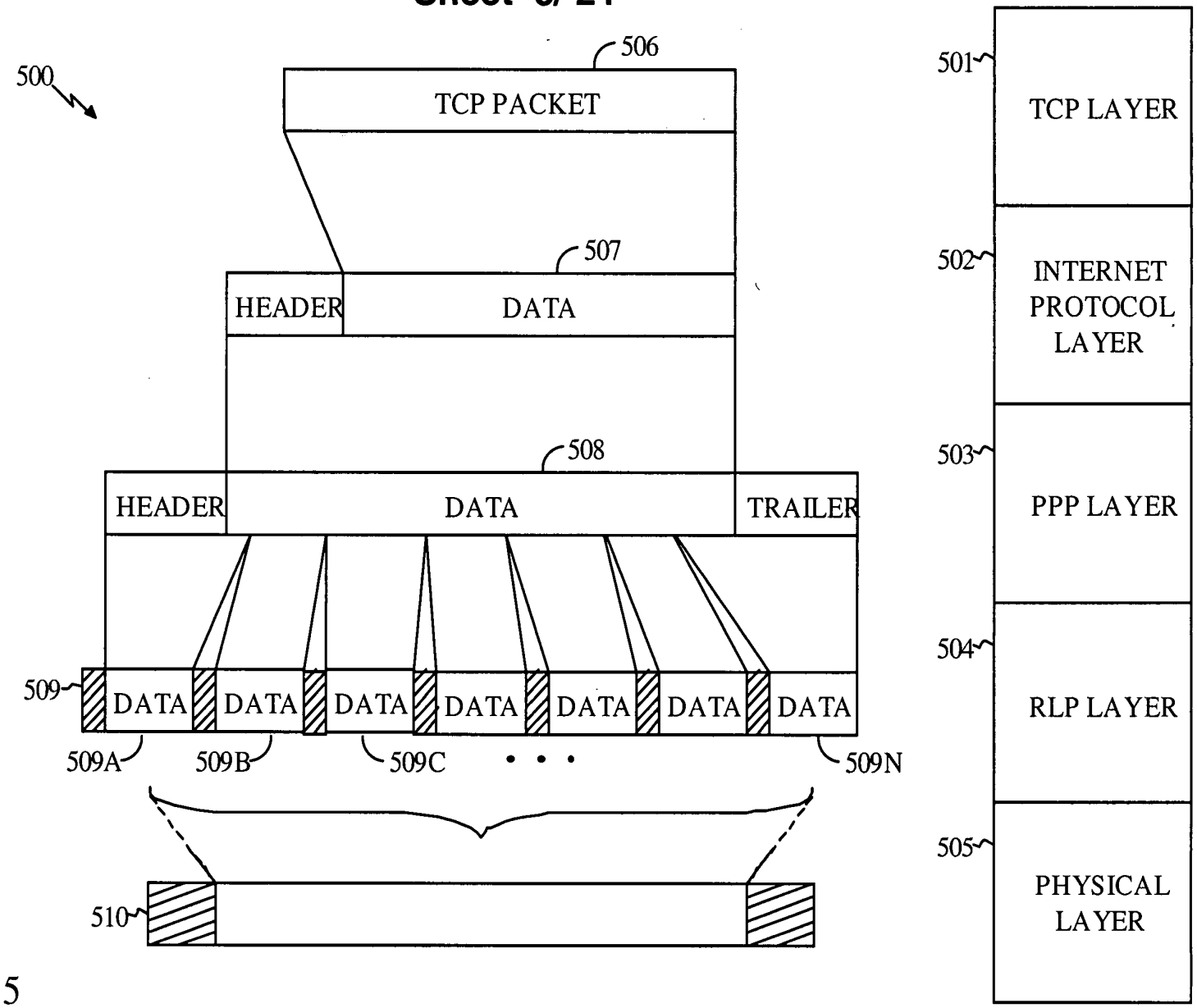
500
506
TCP PACKET
507
HEADER
DATA
508
HEADER
DATA
TRAILER
509
DATA
DATA
DATA
DATA
DATA
DATA
DATA
509A
509B
509C
509N
510
501
TCP LAYER
502
INTERNET PROTOCOL LAYER
503
PPP LAYER
504
RLP LAYER
505
PHYSICAL LAYER

FIG. 5

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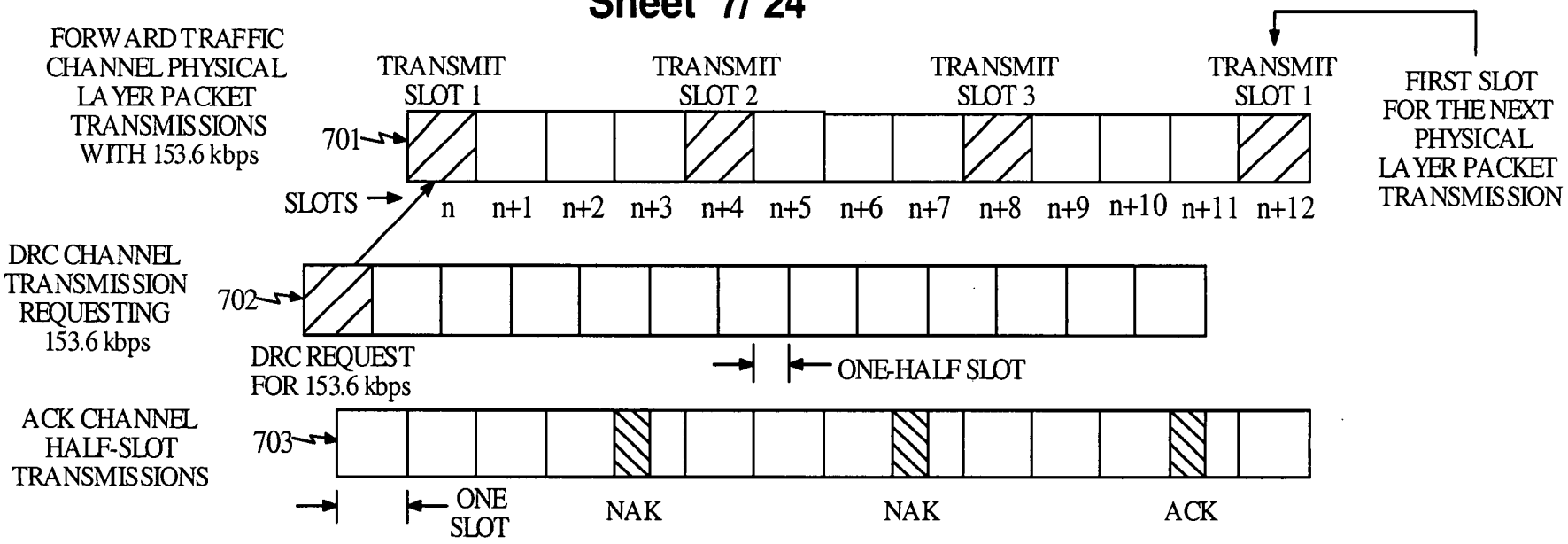
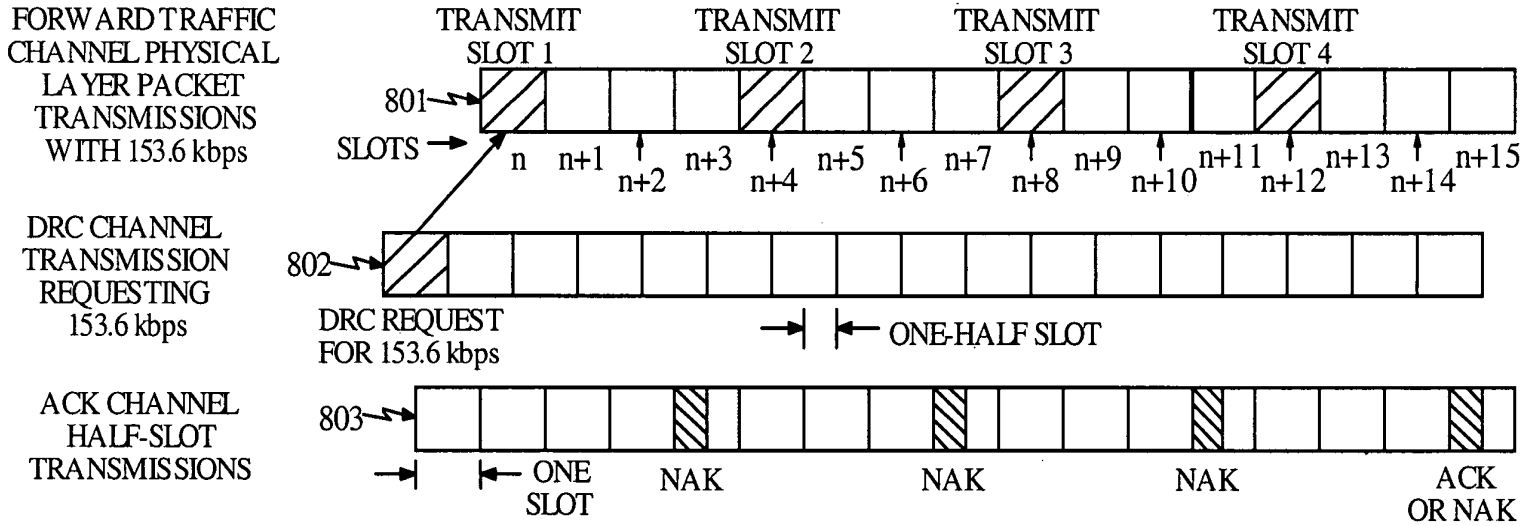
600

DRC VALUE	RATE (kbps)	PACKET LENGTH (SLOTS)
0x0	NULL RATE	N/A
0x1	38.4	16
0x2	76.8	8
0x3	153.6	4
0x4	307.2	2
0x5	307.2	4
0x6	614.4	1
0x7	614.4	2
0x8	921.6	2
0x9	1228.8	1
0xa	1228.8	2
0xb	1843.2	1
0xc	2457.6	1
0xd	INVALID	N/A
0xe	INVALID	N/A
0xf	INVALID	N/A

FIG. 6



EARLY TERMINATION OF TRANSMITTING A PHYSICAL LAYER PACKET OF DATA



NORMAL TERMINATION OF TRANSMITTING A PHYSICAL LAYER PACKET OF DATA

FIG. 7

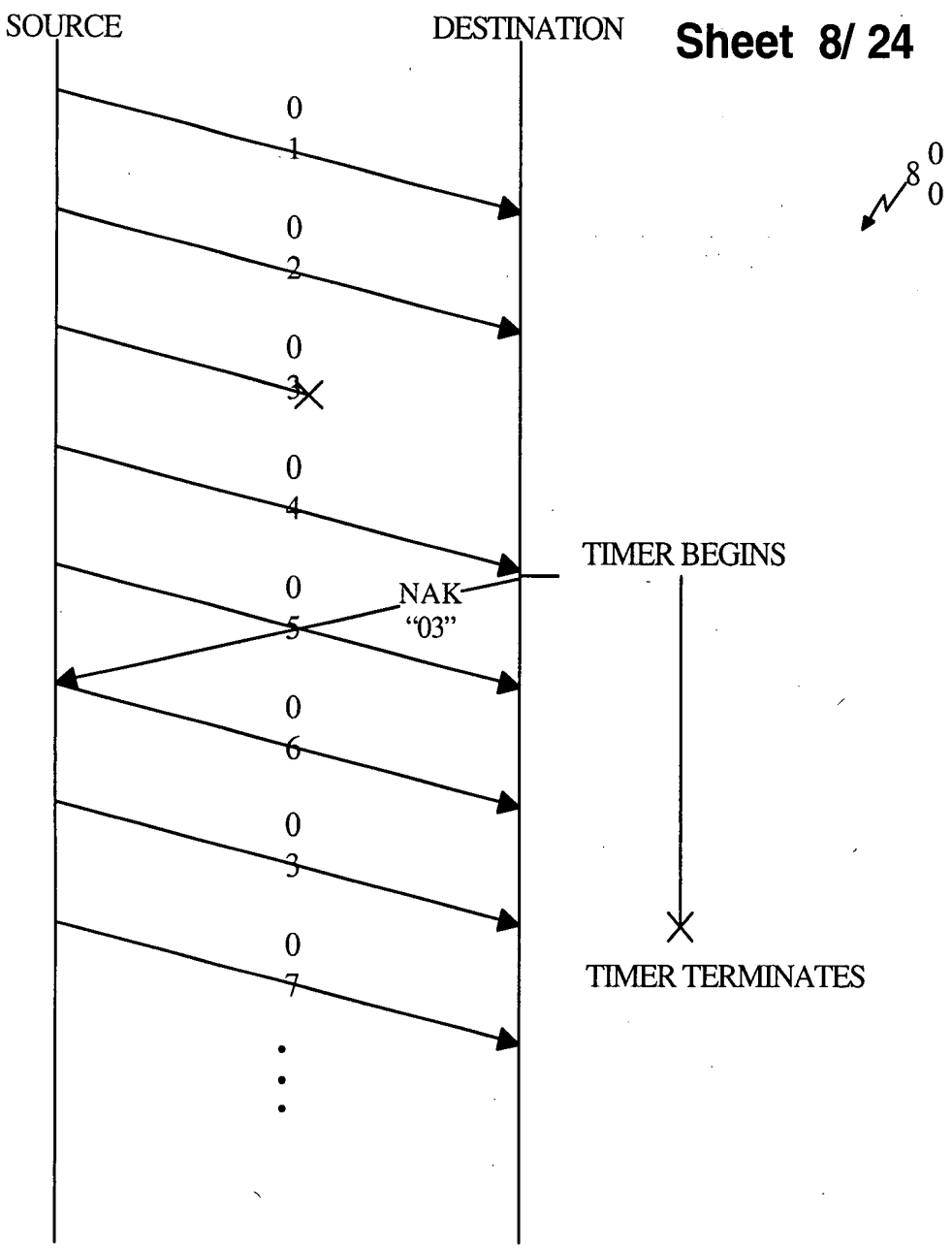
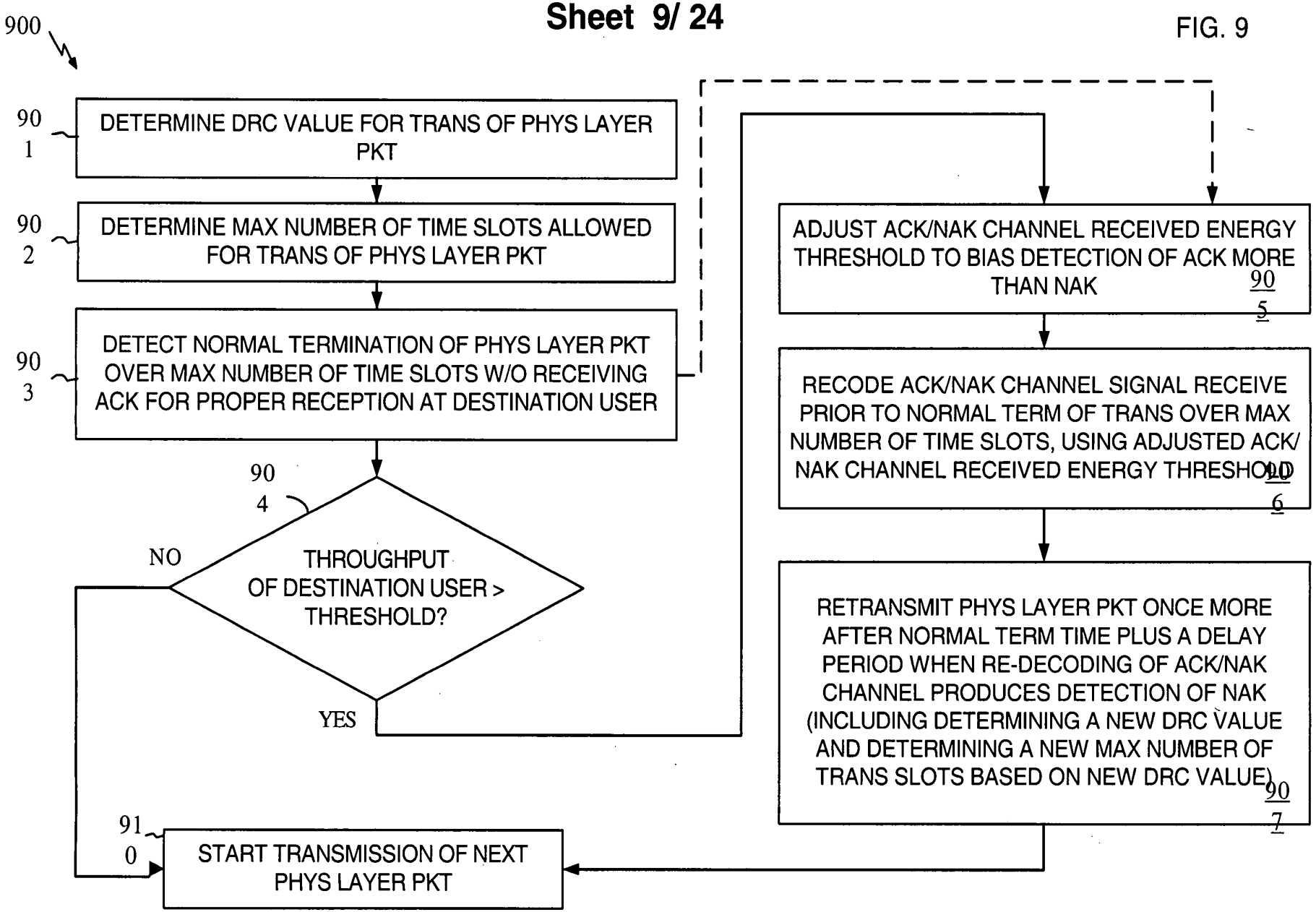

SOURCE
DESTINATION
0 1
0 2
0 3
0 4
0 5
0 6
0 3
0 7
0 8 0 0
TIMER BEGINS
NAK "03"
TIMER TERMINATES

FIG. 8

FIG. 9


900
901
DETERMINE DRC VALUE FOR TRANS OF PHYS LAYER PKT
902
DETERMINE MAX NUMBER OF TIME SLOTS ALLOWED FOR TRANS OF PHYS LAYER PKT
903
DETECT NORMAL TERMINATION OF PHYS LAYER PKT OVER MAX NUMBER OF TIME SLOTS W/O RECEIVING ACK FOR PROPER RECEPTION AT DESTINATION USER
904
THROUGHPUT OF DESTINATION USER > THRESHOLD?
NO
YES
905
ADJUST ACK/NAK CHANNEL RECEIVED ENERGY THRESHOLD TO BIAS DETECTION OF ACK MORE THAN NAK
906
RECODE ACK/NAK CHANNEL SIGNAL RECEIVE PRIOR TO NORMAL TERM OF TRANS OVER MAX NUMBER OF TIME SLOTS, USING ADJUSTED ACK/NAK CHANNEL RECEIVED ENERGY THRESHOLD
907
RETRANSMIT PHYS LAYER PKT ONCE MORE AFTER NORMAL TERM TIME PLUS A DELAY PERIOD WHEN RE-DECODING OF ACK/NAK CHANNEL PRODUCES DETECTION OF NAK (INCLUDING DETERMINING A NEW DRC VALUE AND DETERMINING A NEW MAX NUMBER OF TRANS SLOTS BASED ON NEW DRC VALUE)
910
START TRANSMISSION OF NEXT PHYS LAYER PKT

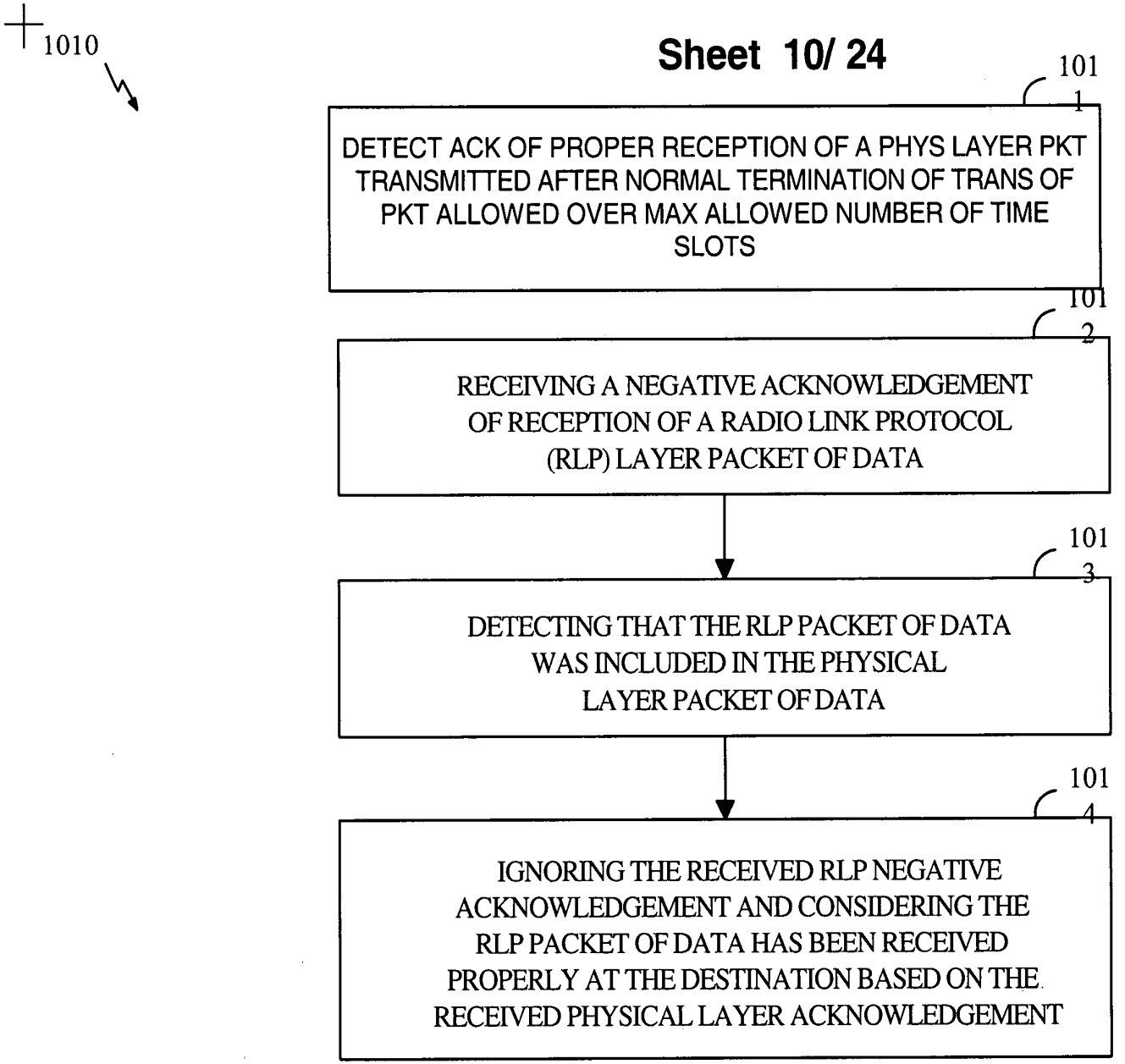

1010
1011
DETECT ACK OF PROPER RECEPTION OF A PHYS LAYER PKT TRANSMITTED AFTER NORMAL TERMINATION OF TRANS OF PKT ALLOWED OVER MAX ALLOWED NUMBER OF TIME SLOTS
1012
RECEIVING A NEGATIVE ACKNOWLEDGEMENT OF RECEPTION OF A RADIO LINK PROTOCOL (RLP) LAYER PACKET OF DATA
1013
DETECTING THAT THE RLP PACKET OF DATA WAS INCLUDED IN THE PHYSICAL LAYER PACKET OF DATA
1014
IGNORING THE RECEIVED RLP NEGATIVE ACKNOWLEDGEMENT AND CONSIDERING THE RLP PACKET OF DATA HAS BEEN RECEIVED PROPERLY AT THE DESTINATION BASED ON THE RECEIVED PHYSICAL LAYER ACKNOWLEDGEMENT

FIG. 10

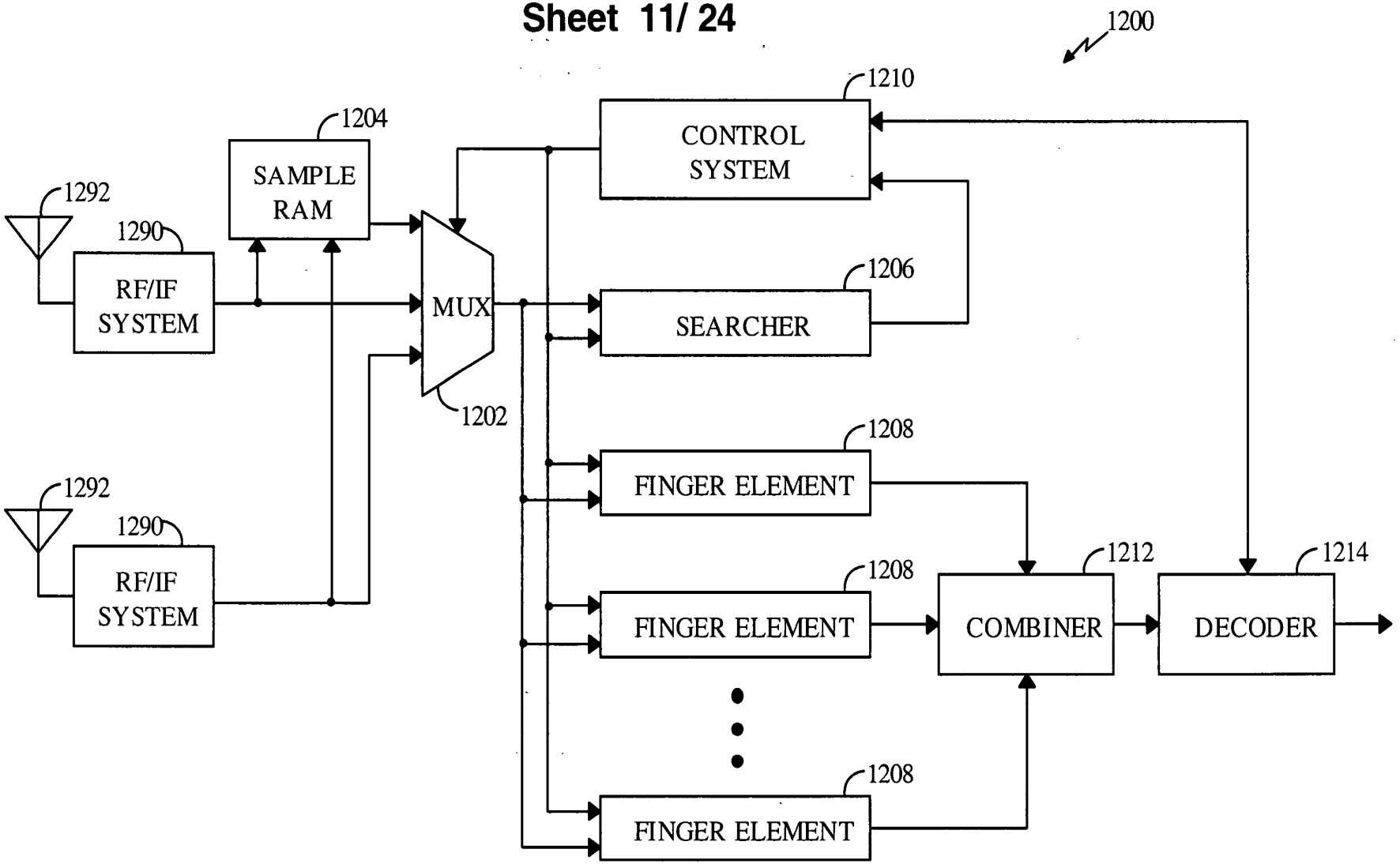

1200
1210
CONTROL SYSTEM
1204
SAMPLE RAM
1292
1290
RF/IF SYSTEM
MUX
1202
1206
SEARCHER
1208
FINGER ELEMENT
1292
1290
RF/IF SYSTEM
1208
FINGER ELEMENT
1212
COMBINER
1214
DECODER
1208
FINGER ELEMENT

FIG. 11

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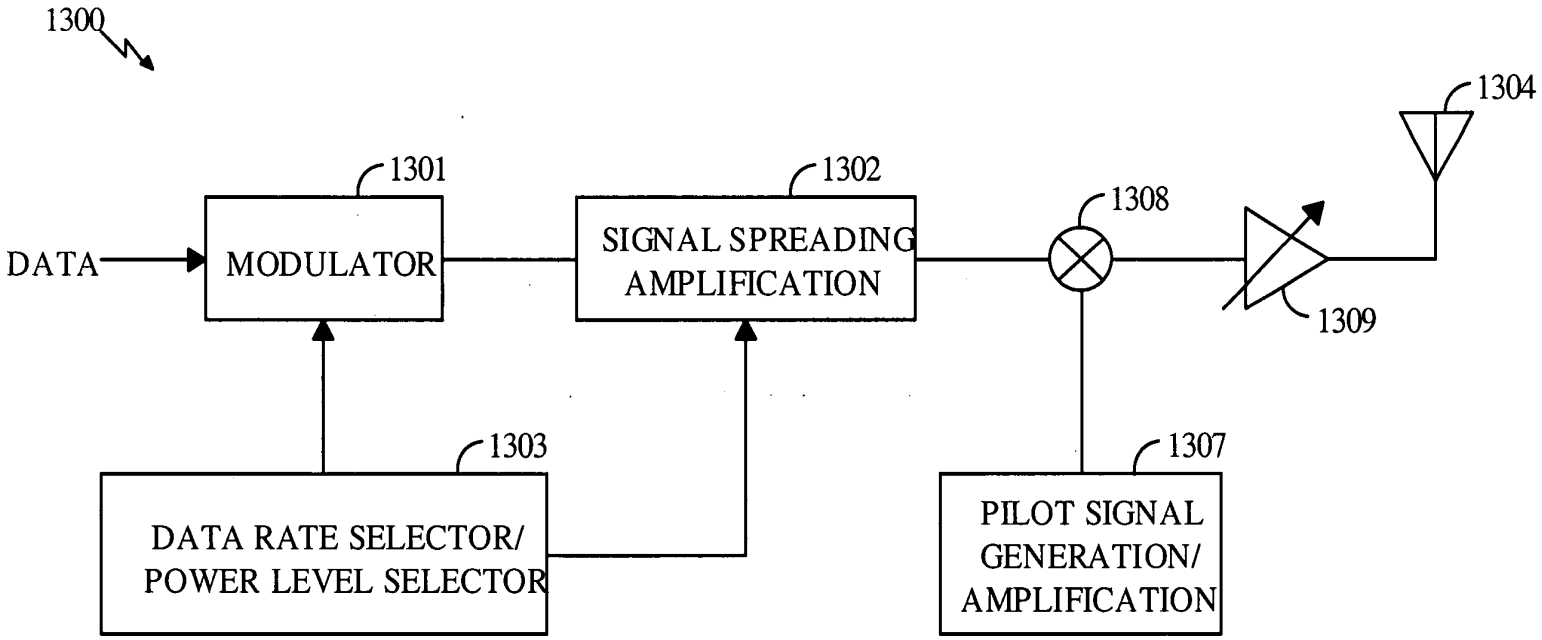

FIG. 12

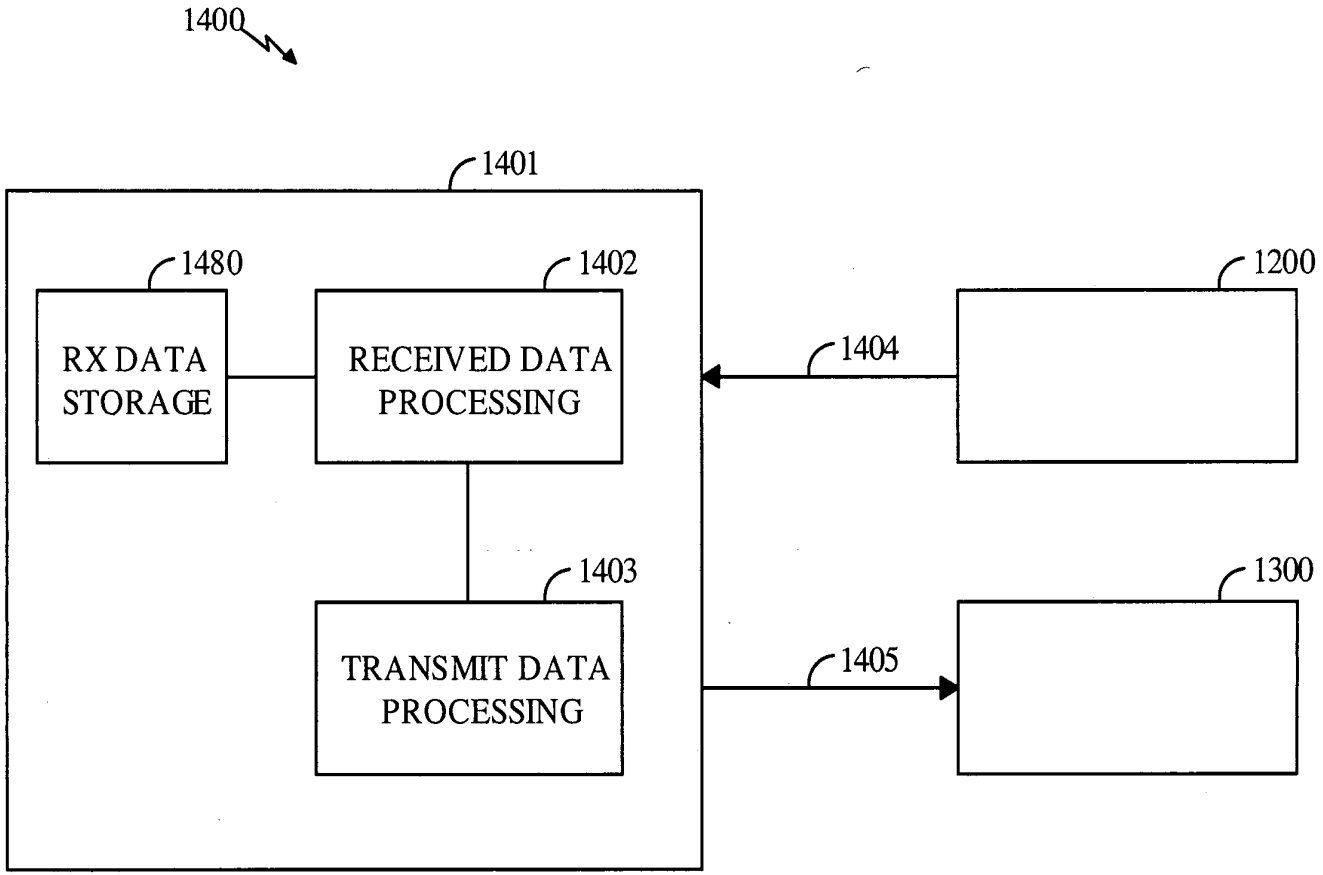
1400
1401
1480
RX DATA STORAGE
1402
RECEIVED DATA PROCESSING
1404
1200
1403
TRANSMIT DATA PROCESSING
1405
1300

FIG. 13

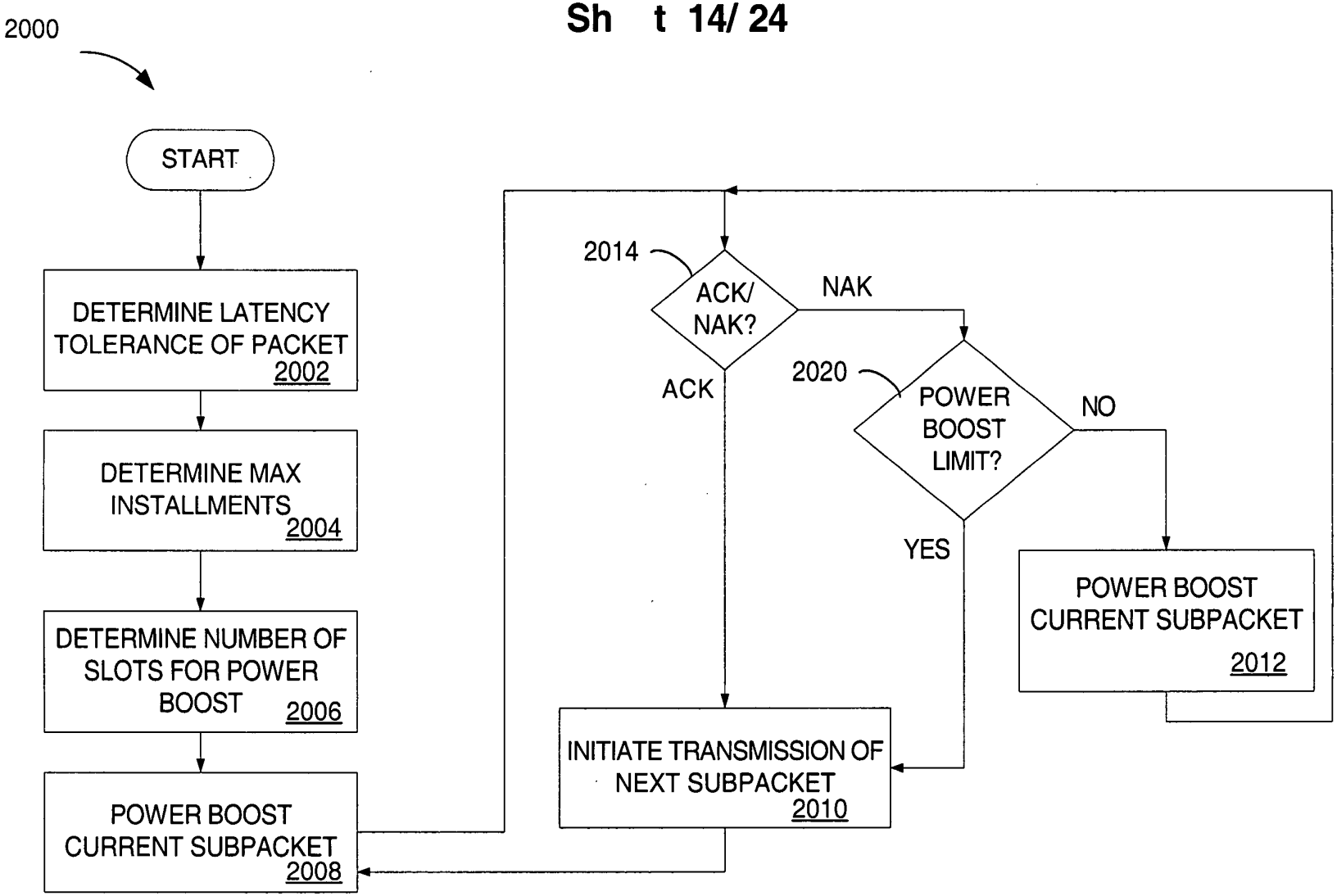
2000
START
DETERMINE LATENCY TOLERANCE OF PACKET 2002
DETERMINE MAX INSTALLMENTS 2004
DETERMINE NUMBER OF SLOTS FOR POWER BOOST 2006
POWER BOOST CURRENT SUBPACKET 2008
INITIATE TRANSMISSION OF NEXT SUBPACKET 2010
2014
ACK/ NAK?
NAK
ACK
2020
POWER BOOST LIMIT?
NO
YES
POWER BOOST CURRENT SUBPACKET 2012

FIG. 14

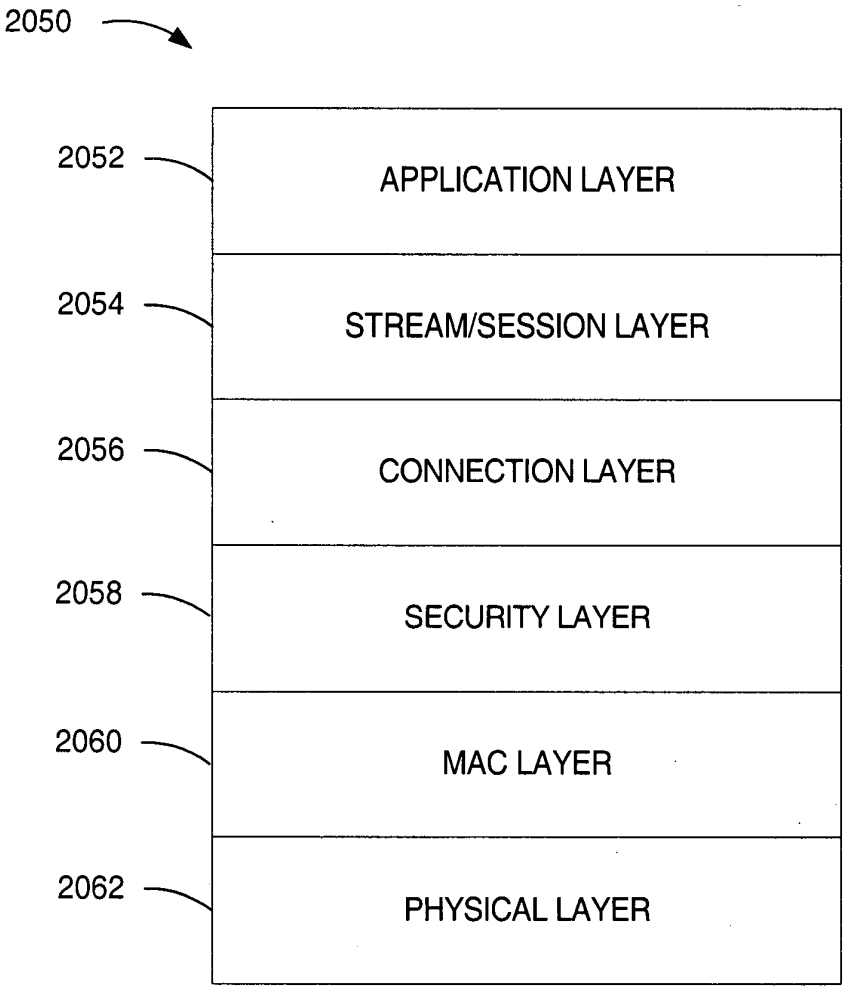
2050
2052
APPLICATION LAYER
2054
STREAM/SESSION LAYER
2056
CONNECTION LAYER
2058
SECURITY LAYER
2060
MAC LAYER
2062
PHYSICAL LAYER

FIG. 15

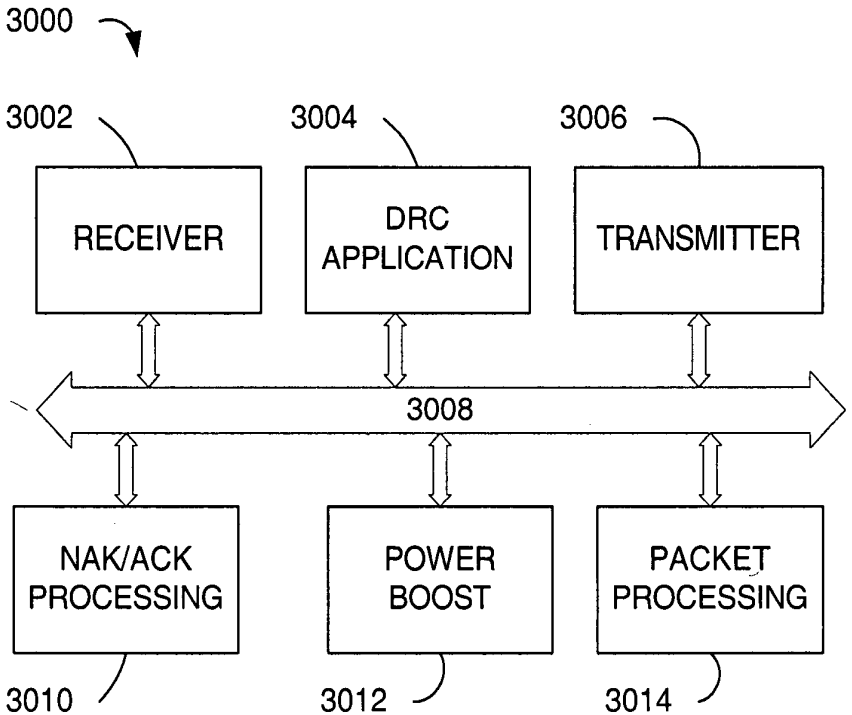
3000
3002
RECEIVER
3004
DRC APPLICATION
3006
TRANSMITTER
3008
NAK/ACK PROCESSING
POWER BOOST
PACKET PROCESSING
3010
3012
3014

FIG. 16

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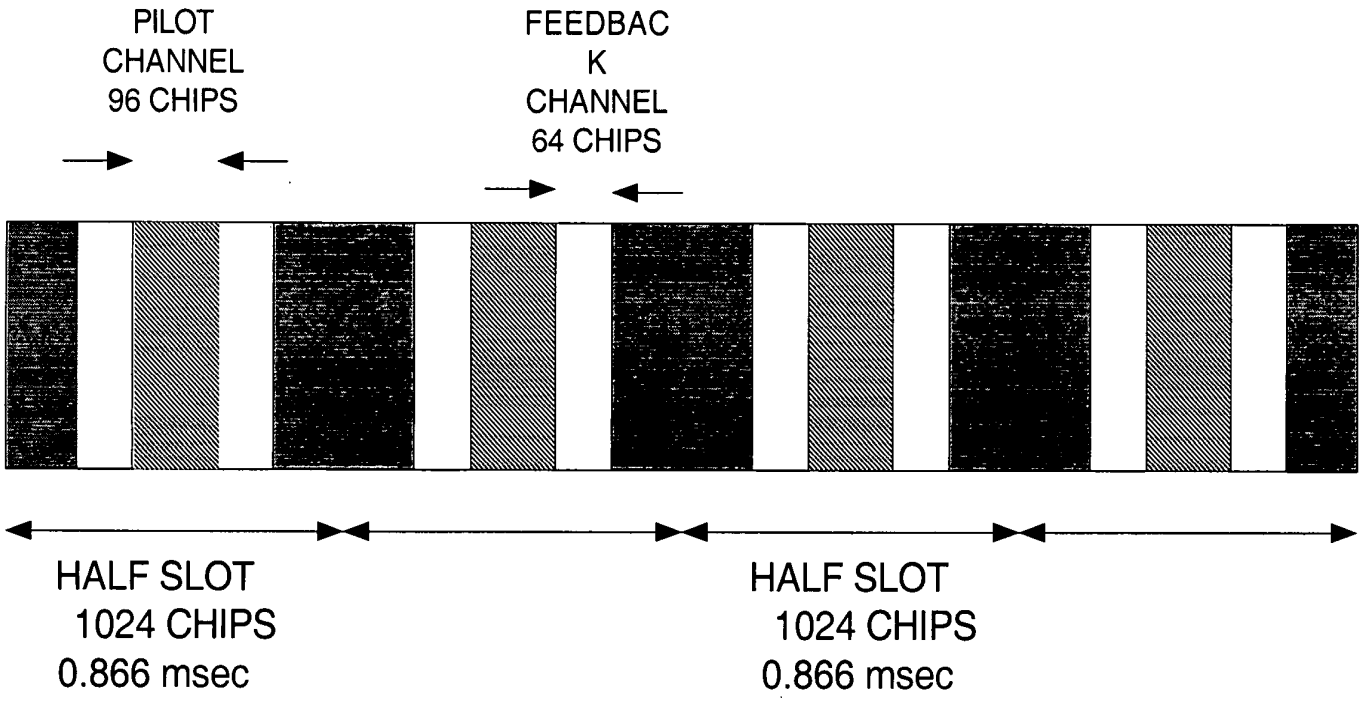

FIG. 17

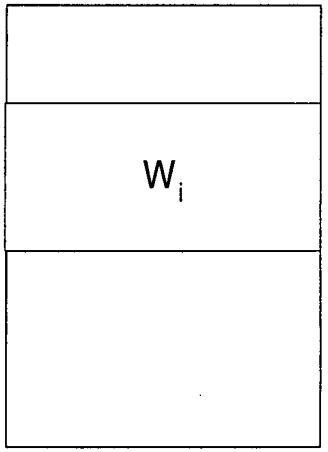

FIG. 18

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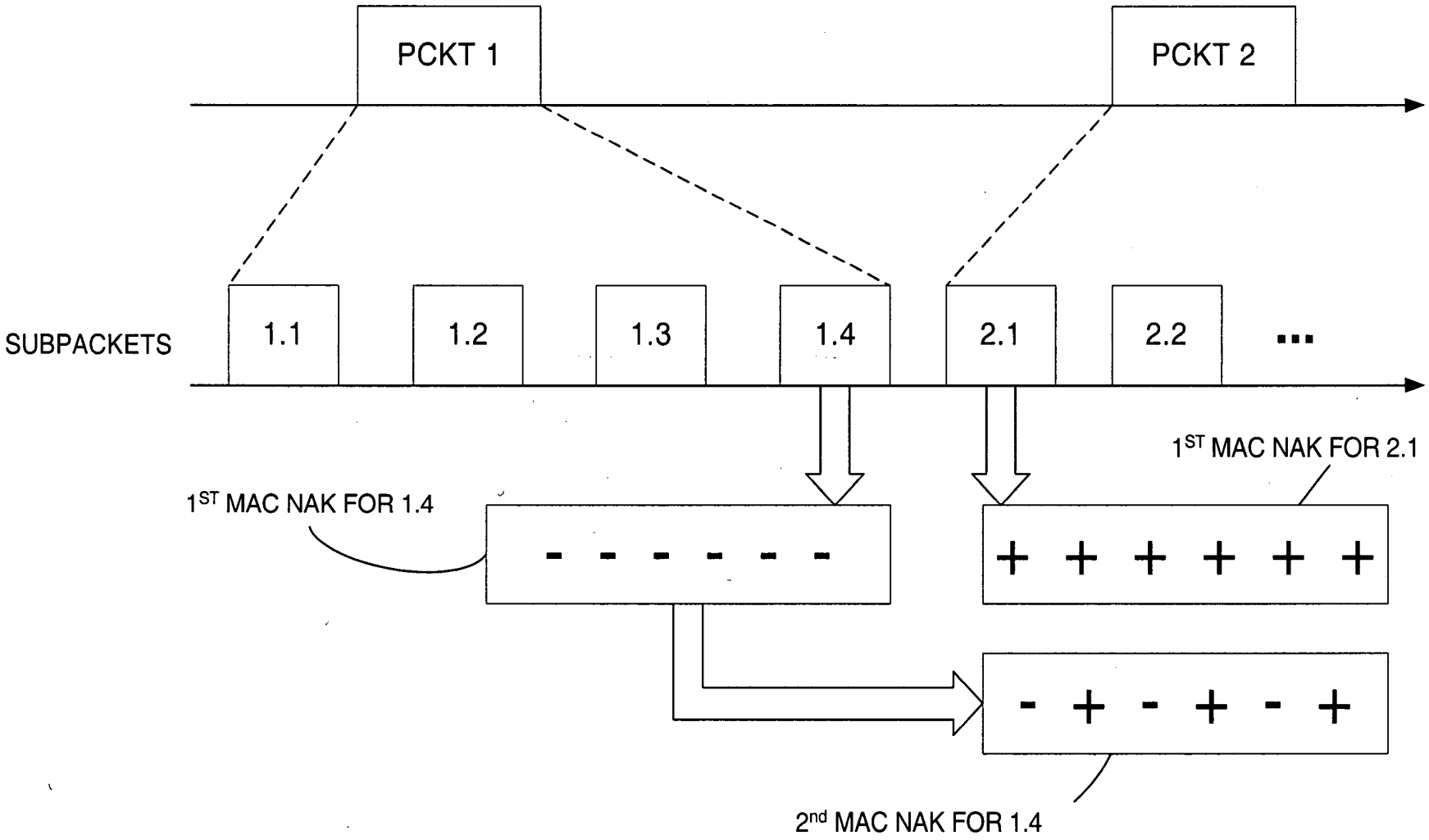

FIG. 19

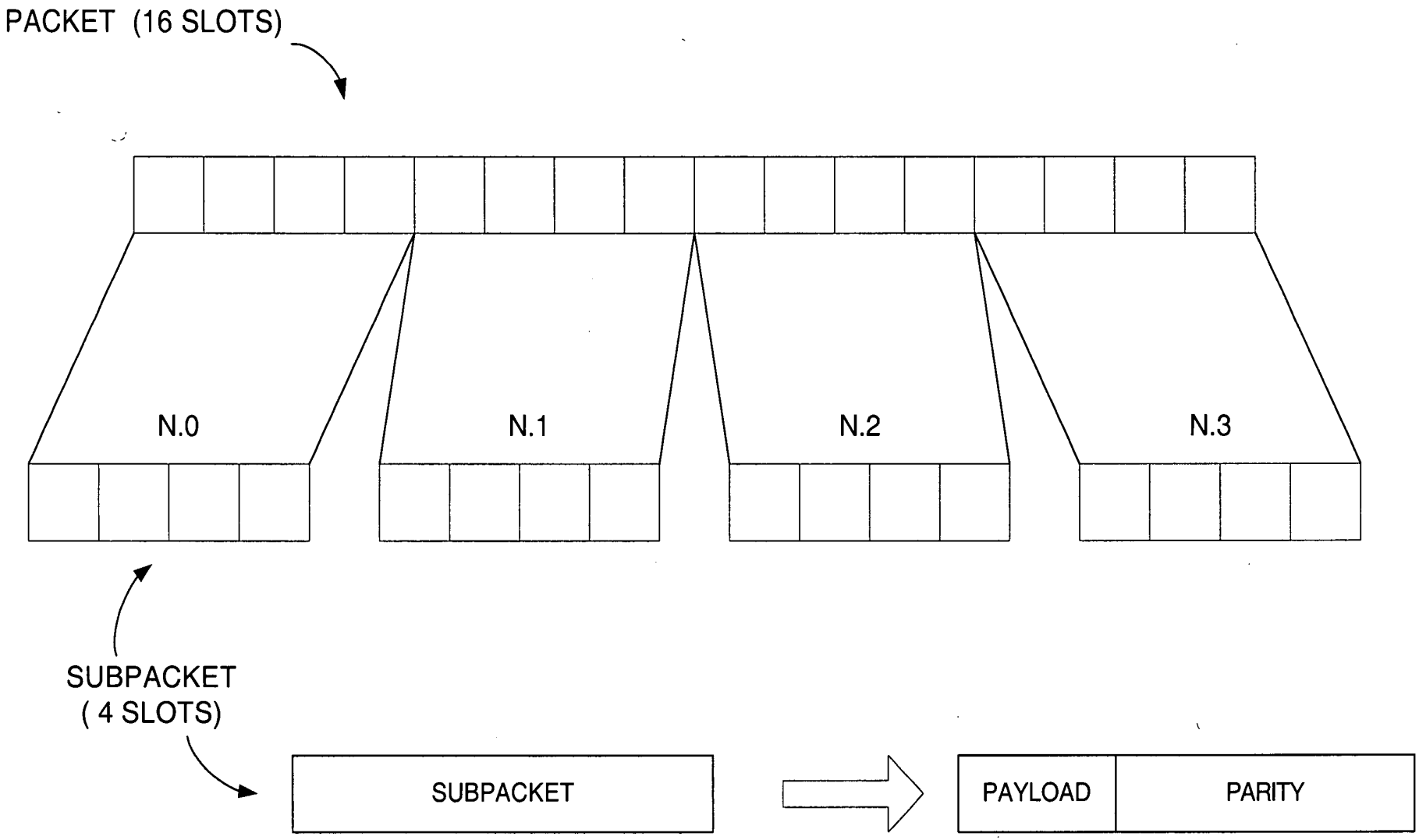
PACKET (16 SLOTS)
N.0
N.1
N.2
N.3
SUBPACKET
(4 SLOTS)
SUBPACKET
PAYLOAD
PARITY

FIG. 20

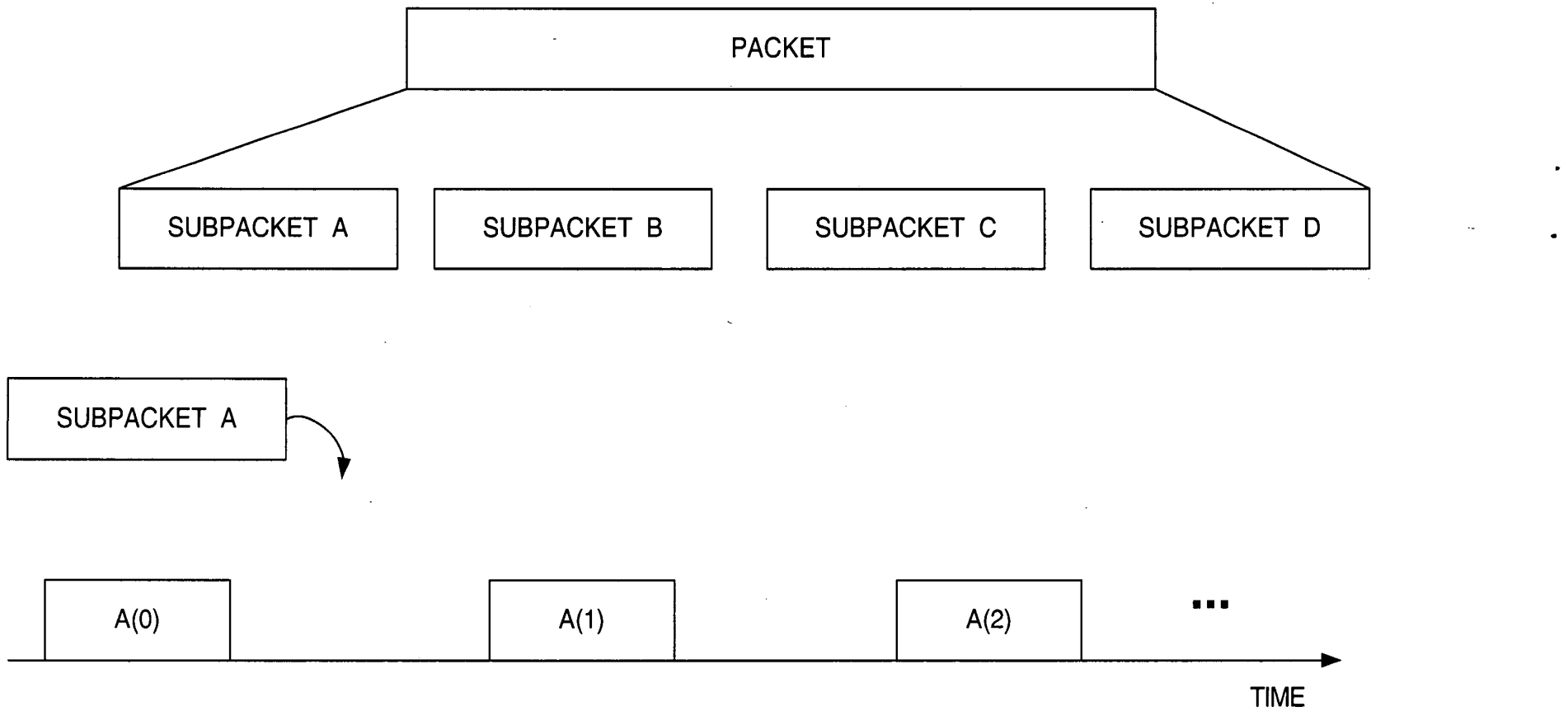
PACKET
SUBPACKET A
SUBPACKET B
SUBPACKET C
SUBPACKET D
SUBPACKET A
A(0)
A(1)
A(2)
...
TIME

FIG. 21

PAYLOAD SIZE (bits)	EFFECTOVE DATA RATE (kbps)			
	AFTER 1 SUBPACKET	AFTER 2 SUBPACKETS	AFTER 3 SUBPACKETS	AFTER 4 SUBPACKETS
[1] 128	19.2	9.6	6.4	4.8
[2] 256	38.4	19.2	12.8	9.6
[3] 512	76.8	38.4	25.6	19.2
[4] 768	115.2	57.6	38.4	28.2
[5] 1024	153.6	76.8	51.2	38.4
[6] 1536	230.4	115.2	76.8	57.6
[7] 2048	307.2	153.6	102.4	76.8
[8] 3072	460.8	230.4	153.6	115.2
[9] 4096	614.4	307.2	204.8	153.6
[10] 6144	921.6	460.4	307.2	230.4
[11] 8192	1228.8	614.4	409.6	307.2

FIG. 22

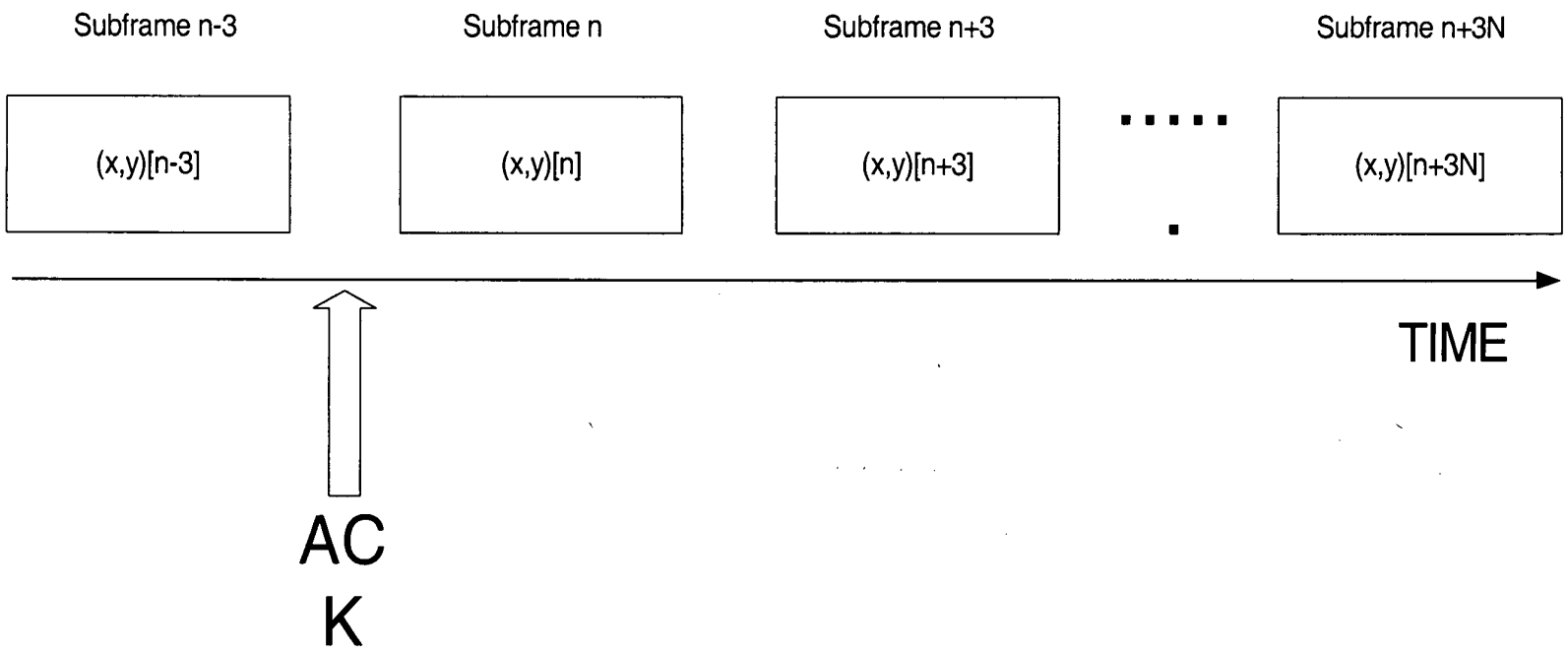
Subframe n-3
Subframe n
Subframe n+3
Subframe n+3N
(x,y)[n-3]
(x,y)[n]
(x,y)[n+3]
(x,y)[n+3N]
TIME
ACK

FIG. 23

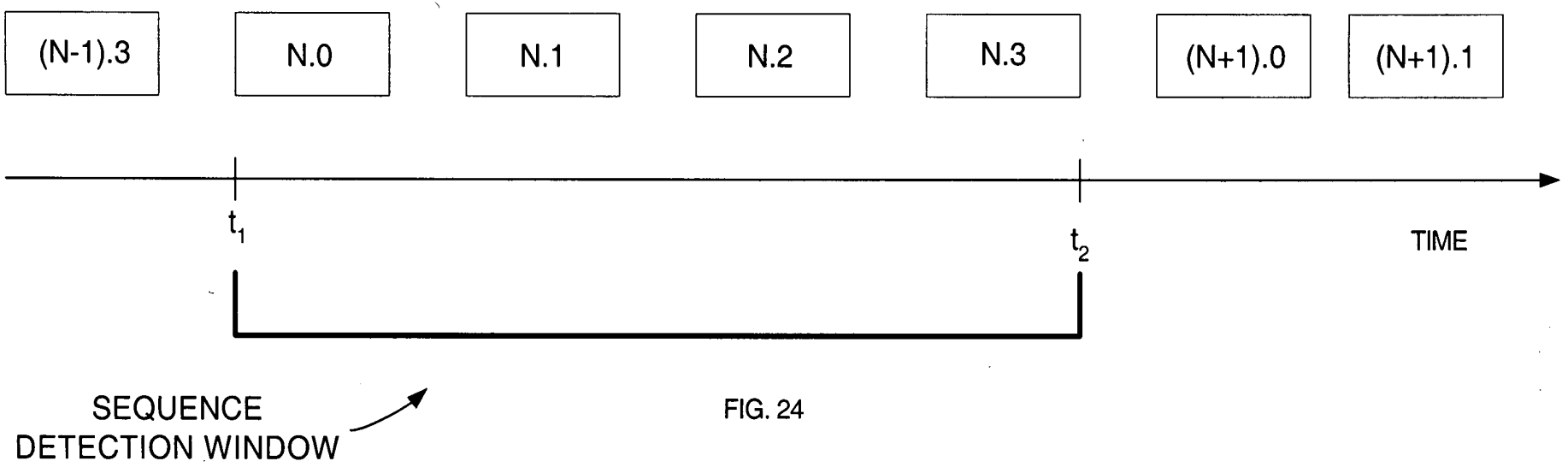
(N-1).3
N.0
N.1
N.2
N.3
(N+1).0
(N+1).1
t1
t2
TIME
SEQUENCE
DETECTION WINDOW

FIG. 24

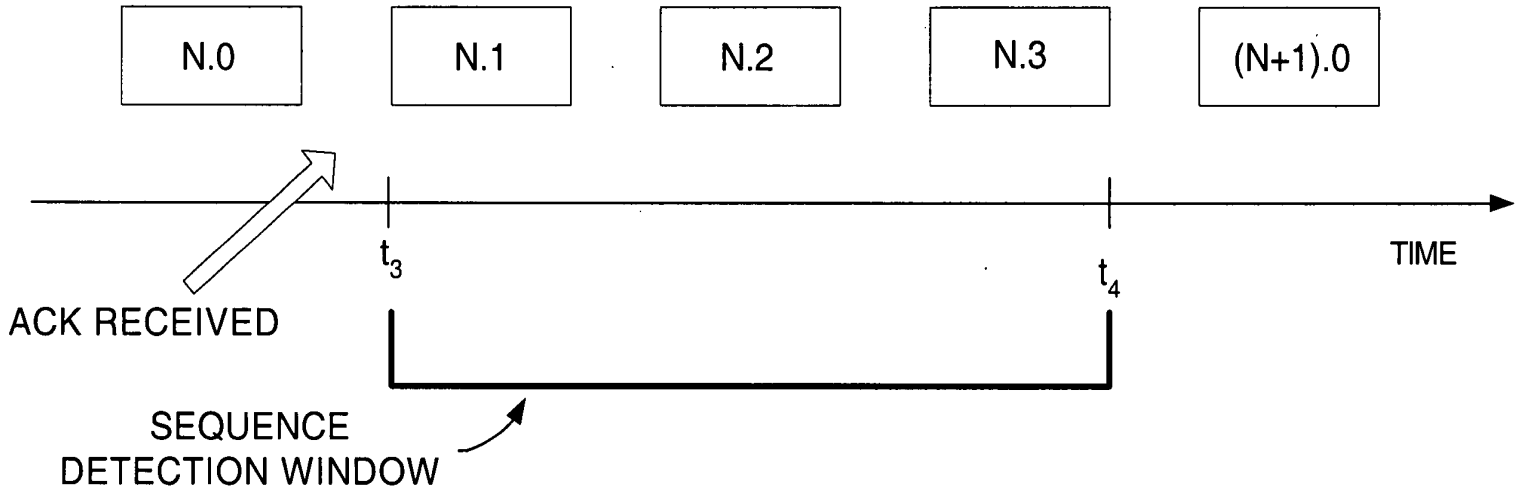
N.0
N.1
N.2
N.3
(N+1).0
t3
t4
TIME
ACK RECEIVED
SEQUENCE
DETECTION WINDOW

FIG. 25

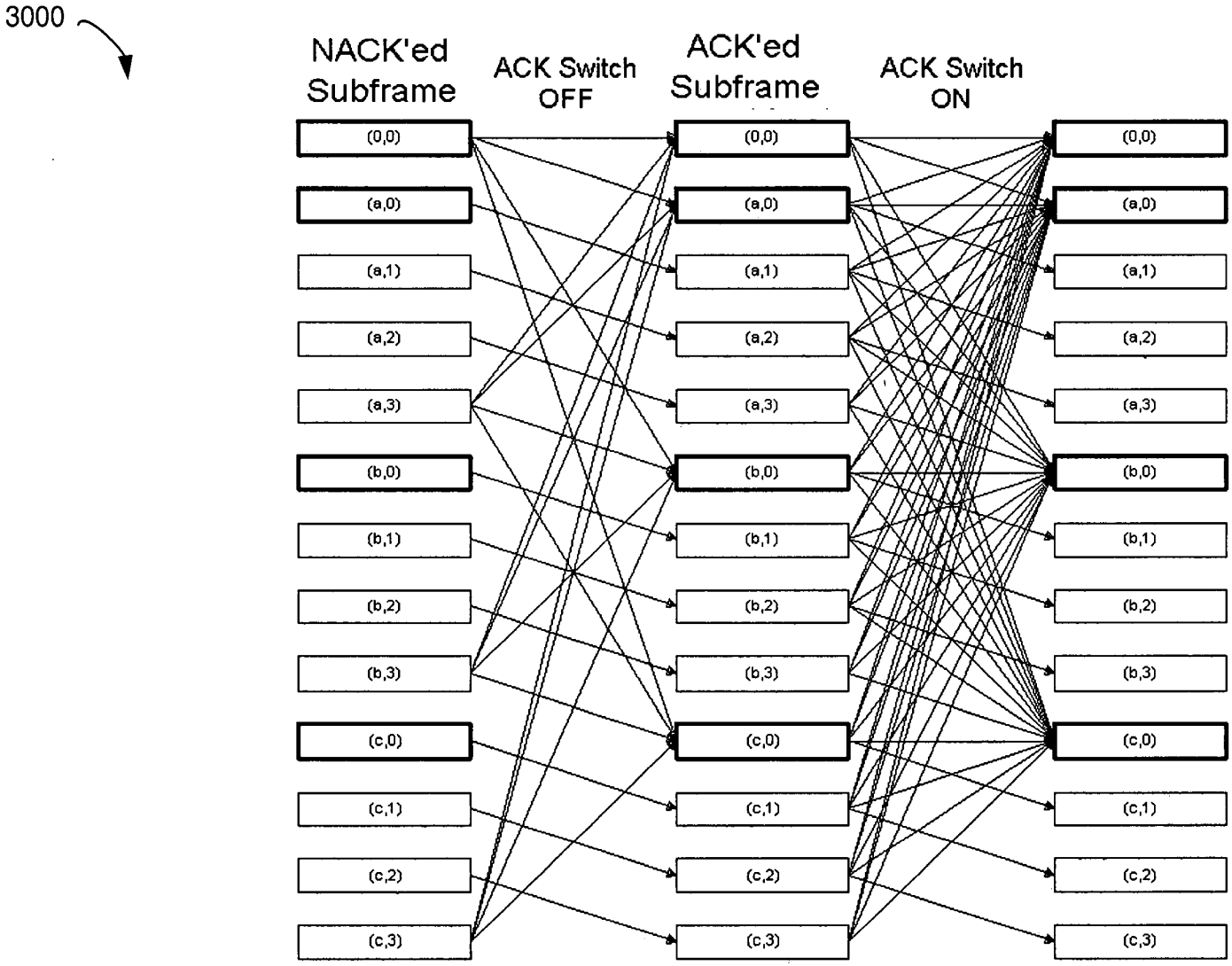
3000
NACK'ed Subframe
ACK Switch OFF
ACK'ed Subframe
ACK Switch ON
(0,0)
(a,0)
(a,1)
(a,2)
(a,3)
(b,0)
(b,1)
(b,2)
(b,3)
(c,0)
(c,1)
(c,2)
(c,3)

FIG. 26

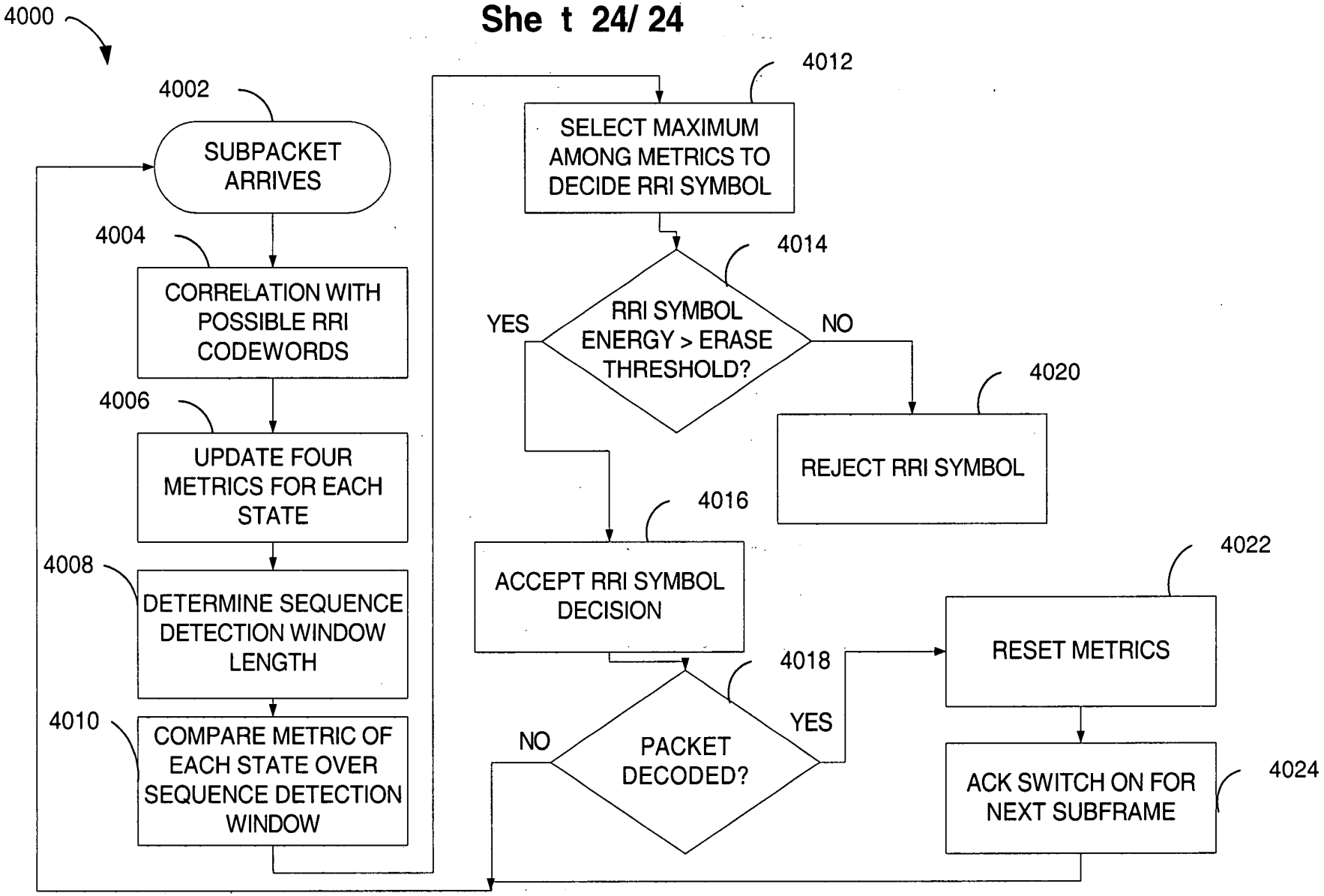
4000
4002
SUBPACKET ARRIVES
4004
CORRELATION WITH POSSIBLE RRI CODEWORDS
4006
UPDATE FOUR METRICS FOR EACH STATE
4008
DETERMINE SEQUENCE DETECTION WINDOW LENGTH
4010
COMPARE METRIC OF EACH STATE OVER SEQUENCE DETECTION WINDOW
4012
SELECT MAXIMUM AMONG METRICS TO DECIDE RRI SYMBOL
4014
RRI SYMBOL ENERGY > ERASE THRESHOLD?
YES
NO
4020
REJECT RRI SYMBOL
4016
ACCEPT RRI SYMBOL DECISION
4018
PACKET DECODED?
NO
YES
4022
RESET METRICS
4024
ACK SWITCH ON FOR NEXT SUBFRAME

FIG. 27